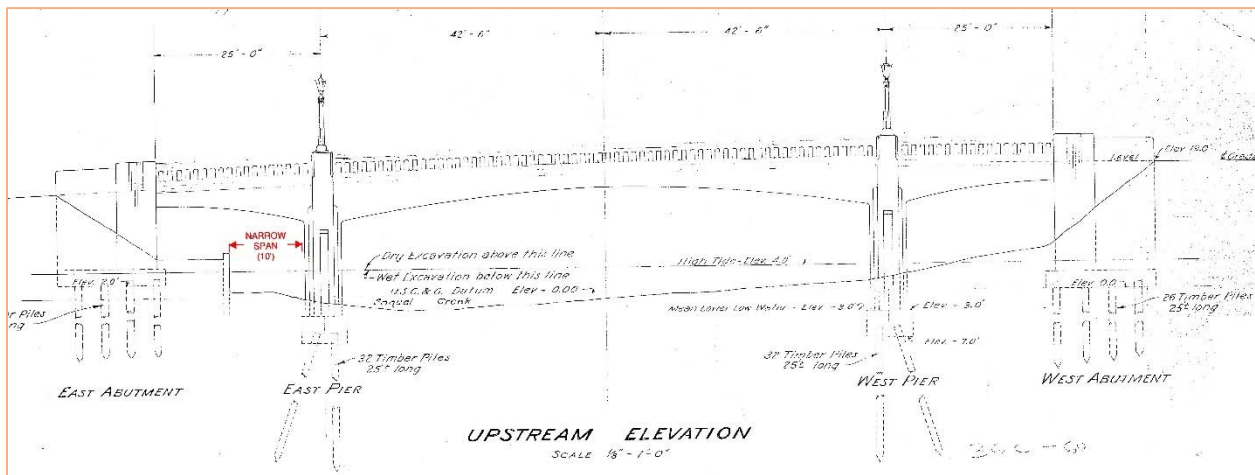


WORK PLAN

Stockton Avenue Bridge is located in the lower reaches of the Soquel Creek Watershed, which is located between the cities of Santa Cruz and Watsonville. Soquel Creek watershed drains an area of approximately 42 square miles. The watershed is comprised of urban development, rural residential development, agriculture, parks and recreation, and mining and timber harvesting. The Village, a cultural and business center in Capitola, is located at the terminus of Soquel Creek, where it enters the Pacific Ocean.

The Stockton Avenue Bridge and low lying Capitola Village are located in the flood zone. Storm events can result in a significant amount of large woody debris (LWD), which can get blocked at the Stockton Bridge and further exacerbate flood conditions. LWD is important to the ecology of rivers and streams, however to mitigate and reduce the risk to flooding, LWD is typically removed. Removal is a costly and annual maintenance issue. To address flooding risks at Stockton Avenue Bridge, which has a history of LWD-related flooding, a LWD-passing approach rather than removal is suggested in the 2011 UC Berkeley study titled "Large Woody Debris in Urban Stream Channels: Redefining the Problem." The study identifies the average tree length in the watershed is between 15 and 30 feet long. The narrows clear span of the bridge piers is 10 feet. This appears to cause buildup of debris that can span the whole creek width and cause significant flooding to the Capitola Village.



The 2016 Due Diligence memorandum, prepared by Kimley Horn, identified four potential debris control countermeasures: debris sweeper, debris fins, debris deflectors and bridge replacement.

Our scope of work generally follows the City's proposed work plan, however, we have identified potential additional scope for environmental permitting that is not covered in our scope of work. Soquel Creek is both a water of the United States and California and located within the California Coastal Zone. Any work proposed below the ordinary high water line will require permits from both State and Federal agencies including:

- Central Coast Regional Water Quality Control Board Clean Water Act Section 401 Water Quality Certification.
- California Department of Fish and Wildlife Section 1602 Streambed Alteration Agreement
- Army Corps of Engineers Rivers and Harbor Act Section 10 Permit
- Based on the result of a habitat assessment, Biological Opinions may also be needed from United States Fish and Wildlife Service and National Marine Fisheries Service.
- Coastal Development Permit

The following scope of work separates the project into two tasks which are summarize as follows:

Phase 1. Under this task we will evaluate the debris mitigation measures for constructability, cost, effectiveness, and hydraulics. We will develop reports and 35% conceptual plans depicting the preferred debris mitigation measure.

Phase 2. In this phase we will perform final design of the preferred debris mitigation measures sufficient for contract bidding. We assume that if bridge replacement is the preferred method of debris mitigation then the design work will be addressed under a separate contract and exclude it from this scope of work.

Our scope of work to support the debris mitigation at Stockton Street Bridge includes the following elements:

PHASE 1: Concept Design & Preliminary Design Engineering Services

In this initial phase, our team will work with City staff to review project goals and develop a process for stakeholder outreach.

1.1 Project Kickoff. Key members of our team will meet with City staff to review the goals and objectives of the project. During this meeting, we will review opportunities to finalize the schedule for Phase 1.

1.2 Data Collection. Our team will perform a site visit to assess the existing conditions and review all documents prepared by Capitola, Santa Cruz County, FEMA and other agencies.

1.3 Hydraulic Model. The most recent modeling performed for Soquel Creek, according to the 2017 Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) for Santa Cruz County, CA, was done in 1983 and consisted of the United States Army Corps of Engineers (USACE) Hydraulic Engineering Center (HEC) HEC-2 model, and was based upon 1978 aerial topography of 4' contour interval. It will be more efficient and better suited to the goal of the analysis, to create a new model based on current available topographic elevation reflecting contemporary development and terrain conditions, rather than submitting a record request to FEMA for the 1983 model.

A 1D/2D model will be developed using the USACE Hydraulic Engineering Center River Analysis System (HEC-RAS) to evaluate hydraulic conditions upstream and downstream of the bridge, vertical clearance under the bridge, and possible floating debris flow paths. Channel information will be drawn from 2'-interval contours available from Santa Cruz County Geographic Information Services. Dimensions for the Stockton Bridge will be pulled from the 1933 structural plans. 10- and 100-year flow information and channel roughness from the FIS will be used.

- 1.4 Geotechnical Assessment.** ENGEO will review the as-built bridge drawings and attend the site visit under Task 1.2. ENGEO will provide a geotechnical assessment of the four (4) debris counter measures and their associated geotechnical impact on the existing bridge. Phase 2 geotechnical work is assumed to be covered under a separate contract.
- 1.5 Structural Assessment.** Biggs Cardosa Associates will review the as-built bridge drawings and attend the site visit under Task 1.2. They will prepare an assessment of the structural condition of the bridge to support the four (4) debris counter measures.
- 1.6 Biological Resources & Permitting Strategies.** Denise Duffy & Associates will prepare a Biological Technical Memorandum and Wetland Delineation. The Biological Technical Memorandum will evaluate up to three potential debris mitigation solutions and will include a discussion of the applicable natural resource agency permits that may be required to construct the solutions. The Wetland Delineation will be of sufficient content to secure a jurisdictional determination from the Army Corps of Engineers. Denise Duffy & Associates will prepare a memorandum outlining necessary environmental permits and strategies to obtain permitting, this scope assumes consultant services for environmental permitting will be covered under a separate scope.
- 1.7 Bridge Pier Debris Mitigation Feasibility Report.** We will prepare a feasibility report summarizing the site conditions, debris control measure alternatives assessed, evaluation of the debris control measures, permitting requirements, infrastructure assessment, geotechnical assessment, and cost analysis.
- 1.8 Preliminary Engineering Design Report.** We will prepare a report that summarizes our findings and recommendations outlined in the Bridge Pier Debris Mitigation Feasibility report completed as part of Task 1.4. The report will include analysis of each debris mitigation measure, cost estimate and 35% conceptual plan of the recommended debris mitigation measure.
- 1.9 Presentation to Council.** Our team will present the findings of the Preliminary Engineering Design Report to the Council.
- 1.10 Contract Management.** CSW/ST2 will be responsible for overall management of our design team including the following:
- A. Project Management.** We will manage the design team as well as track progress, schedule, and budget. We will be responsible for documenting decisions and keeping an official record of the project. Furthermore, we will submit monthly progress reports identifying tasks completed, budget status, and issues status.
 - B. Quality Control/ Assurance.** We will perform an independent quality control review of the team's documents prior to submittal.
 - C. Meetings.** In addition to the kickoff meeting, we will attend two meetings during this phase to coordinate the activity.

PHASE 2. Final Design

Objective: With the conclusion of the environmental review process, our team will prepare final documents for use in bidding and construction. We assume that if bridge replacement is the preferred method of debris mitigation then the final design will be addressed under a separate contract.

7.1 Final Design. Our team will prepare final documents at the 65%, 95%, and final level of design including the following:

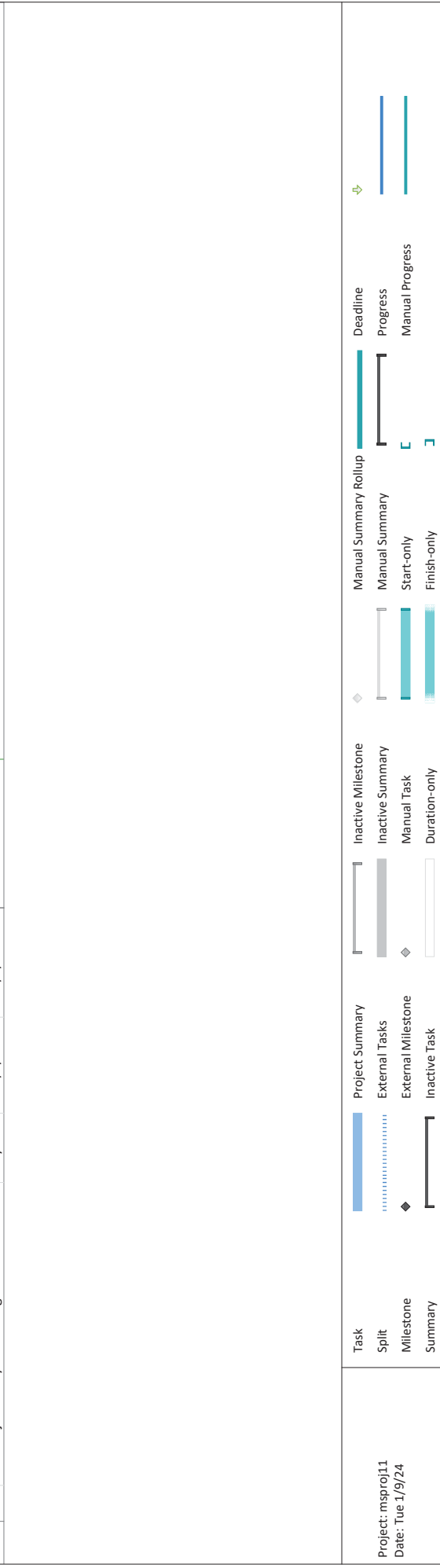
- A.** Plans
 - i. Title sheet and vicinity map
 - ii. Resource Protection Plan
 - iii. Site Clearing Plan
 - iv. Debris Mitigation Layout Plan and Sections
 - v. Details
 - vi. Erosion Control Plan
- B.** Structural calculations, as needed
- C.** Specifications and bid schedule consistent with the Capitola's standards with modifications for federal funding should it be available.
- D.** Recommended Construction Schedule
- E.** Storm Water Pollution and Prevention Plan, as needed
- F.** Water Quality Management Plan, as needed
- G.** Cost estimate and bid schedule

7.2 Contract Management. CSW/ST2 will complete the tasks as defined in Task 1 as well as attend two (2) meetings during this phase.

Key Deliverables. We will provide electronic (PDF and native format) of the following documents:

- a. Plans, specifications, and support documents in PDF and hardcopy formats
- b. Final documents in PDF, hardcopy, and AutoCAD format

ID	Task Name	Duration	Start	Finish	2024	2025
1	Stockton Bridge Debris Mitigation Project	365 days	Thu 2/15/24	Wed 7/9/25	Jan	Jan
2	Notice to Proceed	0 days	Thu 2/15/24	Thu 2/15/24	Feb	Feb
3	Phase 1 Preliminary Engineering & Conceptual	149 days	Thu 2/15/24	Tue 9/10/24	Mar	Mar
4	Kick off Meeting	1 day	Thu 2/15/24	Thu 2/15/24	Feb	Feb
5	Data Collection	14 days	Fri 2/16/24	Wed 3/6/24	Feb	Feb
6	Hydraulic Modeling	60 days	Thu 3/7/24	Wed 5/29/24	Mar	Mar
7	Geotechnical Assesment	30 days	Thu 3/7/24	Wed 4/17/24	Mar	Mar
8	Biological Resources & Permitting Strategie	60 days	Thu 3/7/24	Wed 5/29/24	Mar	Mar
9	Structural Assesment	30 days	Thu 3/7/24	Wed 4/17/24	Mar	Mar
10	Bridge Pier Debris Mitigation Feasibility Rep	14 days	Thu 5/30/24	Tue 6/18/24	May	May
11	Preliminary Engineering Design Report & 35% Concept Plans	40 days	Wed 6/19/24	Tue 8/13/24	Jun	Jun
12	Staff Review	14 days	Wed 8/14/24	Mon 9/2/24	Aug	Aug
13	Presentation to Council	1 day	Tue 9/10/24	Tue 9/10/24	Sep	Sep
14	Environmental Permitting (not in scope)	198 days	Thu 5/30/24	Mon 3/3/25	May	May
15	Phase 2 Final Design	102 days	Wed 9/18/24	Thu 2/6/25	Oct	Oct
16	Prepare 65% PSE	30 days	Wed 9/18/24	Tue 10/29/24	Oct	Oct
17	Staff Review	14 days	Wed 10/30/24	Mon 11/18/24	Nov	Nov
18	Coordination Meeting	0 days	Mon 11/18/24	Mon 11/18/24	Nov	Nov
19	Prepare 95% PSE	30 days	Tue 11/19/24	Mon 12/30/24	Dec	Dec
20	Staff Review	14 days	Tue 12/31/24	Fri 1/17/25	Jan	Jan
21	Coordination Meeting	0 days	Fri 1/17/25	Fri 1/17/25	Jan	Jan
22	Prepare 100% PSE	14 days	Mon 1/20/25	Thu 2/6/25	Jan	Jan
23	Project ready for Bidding	0 days	Thu 2/6/25	Thu 2/6/25	Feb	Feb



Project: mspj11
Date: Tue 1/9/24

Task Legend:

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- Split: Dotted blue bar
- Milestone: Diamond symbol
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- Finish-only: Thin teal bar with diamond
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- Progress: Thin teal bar with diamond
- Manual Progress: Thin teal bar with diamond

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